openreach

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Suppliers' Information Note
For The Openreach Network

Openreach Street Access

Service & Interface Description

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1. Introduction

This Suppliers Information Note (SIN) describes the interface provided with the Openreach Street Access Service. Also provided is some general information on the Street Access service and on some of the physical aspects of the NTE currently being deployed for new customer orders.

This 100Mbit/s version of the service is provided over the Openreach fibre access network. Openreach launched this service on 1st October 2007.

Street Access Services are high speed, point-to-point data circuits that are permanently connected and available 24 hours a day, 365 days per year. Street Access provides a secure link between a remote Street Furniture location and the Communications Provider's (CP's) network accommodation at a BT local serving exchange.

Any specific technology mentioned in this document is current as of today, however it may be subject to change in the future. Should the specification of the interface be changed, this will be notified by a new issue of this SIN. Openreach reserves the right to adapt technology to deliver Street Access as new developments are made. All services are delivered over an uncontended transmission path.

2. Service Outline

2.1 General

The 100Mbit/s Street Access product delivers fixed symmetrical 100Mbit/s Ethernet bandwidth from a BT local serving exchange to a ruggedised terminating unit which is housed in a remote Street Furniture location. The network fibre is permanently connected for the 100Mbit/s product.

The 1000Mbit/s Street Access product delivers fixed symmetrical 1000Mbit/s Ethernet Bandwidth from a BT local serving exchange to a Network Terminating Equipment (NTE) mounted in the customer's mobile vehicle. The 1000Mbit/s service is normally disconnected – network connectivity is made when the vehicle arrives at a site. The customer completes the network fibre connection between the NTE in the vehicle and the permanent fibre presentation in the on-site street cabinet. The customer disconnects the network fibre when finished. The same vehicle NTE may be connected up at different sites.

For the 100Mbit/s service, a Communications Provider (CP) can connect their active equipment to the NTE's Ethernet interface. For example low-powered radio transmitters can be connected to the NTE to create a wireless broadband network that offers the types of value-add services more commonly available at home or in the office. This service could also be used for other applications that are based on Ethernet technology, as per standard Ethernet technology, timing is not transported.

For the 1000Mbit/s service, a CP can connect their Ethernet equipment to the NTEs Ethernet interface, for example live transmission equipment. This service could also be used for other applications that are based on Ethernet technology, as per standard Ethernet technology, timing is not transported.

For the 100Mbit/s service at the BT local serving exchange, up to a maximum of 20 individual Street Access services are terminated on a rack mounted media chassis within the Communications Providers area. This enables simple physical access to each service at the exchange end via a RJ-45 type connector (10/100BaseT). At the remote Street Furniture end the customer data interface is a 4 pin security connector, which provides added physical protection from tampering.

For the 1000Mbit/s service at the BT local serving exchange, up to a maximum of 10 individual Street Access services are terminated on a rack mounted media chassis within the Communications Providers area. This enables simple physical access to each service at the exchange end via a dual LC Multi-mode or Single mode fibre presentation. In the mobile vehicle, a dual LC Multi-mode or single mode fibre presentation is also used.

PLEASE NOTE: The 100Mbit/s service and the 1000Mbit/s service require separate media chassis termination in the serving exchange. Additional chassis can be installed as required to support the growth of an existing Street Access network.

An **Intermediate exchange** is the BT local serving exchange of the street furniture, if distant from the host BT local exchange for the service.

The **Main Link** will be required to provide a route via an intermediate exchange(s) to the host exchange. The maximum radial distance for a main link is 10Km.

A **Host exchange** is the exchange where the service(s) terminate within the CP accommodation.

Access fibre and Incoming fibre cables are the fibre(s) from street furniture (lamp posts or street cabinets) to the host BT exchange.

2.2 100Mbit/s Service Simple network diagram

The simplified diagram in Figure 1 shows how the components of the service are related.

Street Furniture.

Intermediate exchange.

Main Link.

Host exchange.

Access fibre and Incoming fibre cables.

These building blocks can be selected depending on the location of the host exchange which is where services terminate. The service is subject to the overall fibre route length being limited to 20 km (includes Main Link if required). If a main link is required to provide a route from the street furniture via an intermediate exchange(s) to the host exchange. The maximum radial distance for a main link is 10 km.

Note: Fibre hand-over at an intermediate point is not permitted i.e. it must be terminated on Openreach equipment.

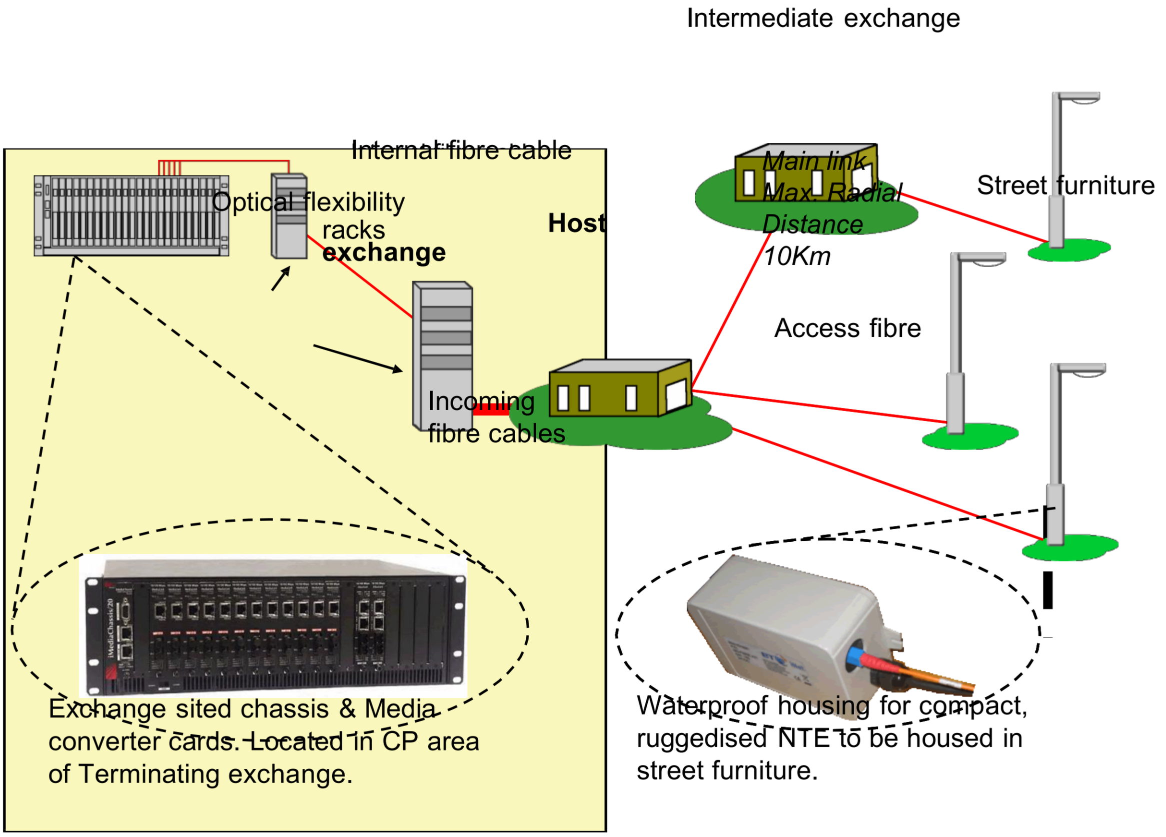

Intermediate exchange
Internal fibre cable
Optical flexibility racks
Host exchange
Main link
Max. Radial Distance
10Km
Street furniture
Access fibre
Incoming fibre cables
Exchange sited chassis & Media converter cards. Located in CP area of Terminating exchange.
Waterproof housing for compact, ruggedised NTE to be housed in street furniture.

Figure 1. Service Block Schematic for 100Mbit/s service

2.3 1000Mbit/s Service Simple network diagram

The simplified diagram in Figure 2 below shows how the components of the service are related.

Street Furniture.

Intermediate exchange.

Main Link.

Host exchange.

Mobile vehicle

The 1Gig Street Access product provides communication providers with a service to connect a vehicle mounted (and transportable) NTE device to a permanently available fibre connection installed in an on-site street cabinet, connected back to a BT exchange.

The service is subject to the overall fibre route length being limited to 60 km. The maximum radial distance for a main link is 30 km. The CP is responsible for providing the ruggedised Optical fibre patch lead (single fibre, single mode male FC/PC to male FC/PC) to connect the vehicle NTE to the onsite street cabinet.

Note: Fibre hand-over at an intermediate point is not permitted i.e. it must be terminated on Openreach NTE mounted in the mobile vehicle.

An outline of the service is shown below:-

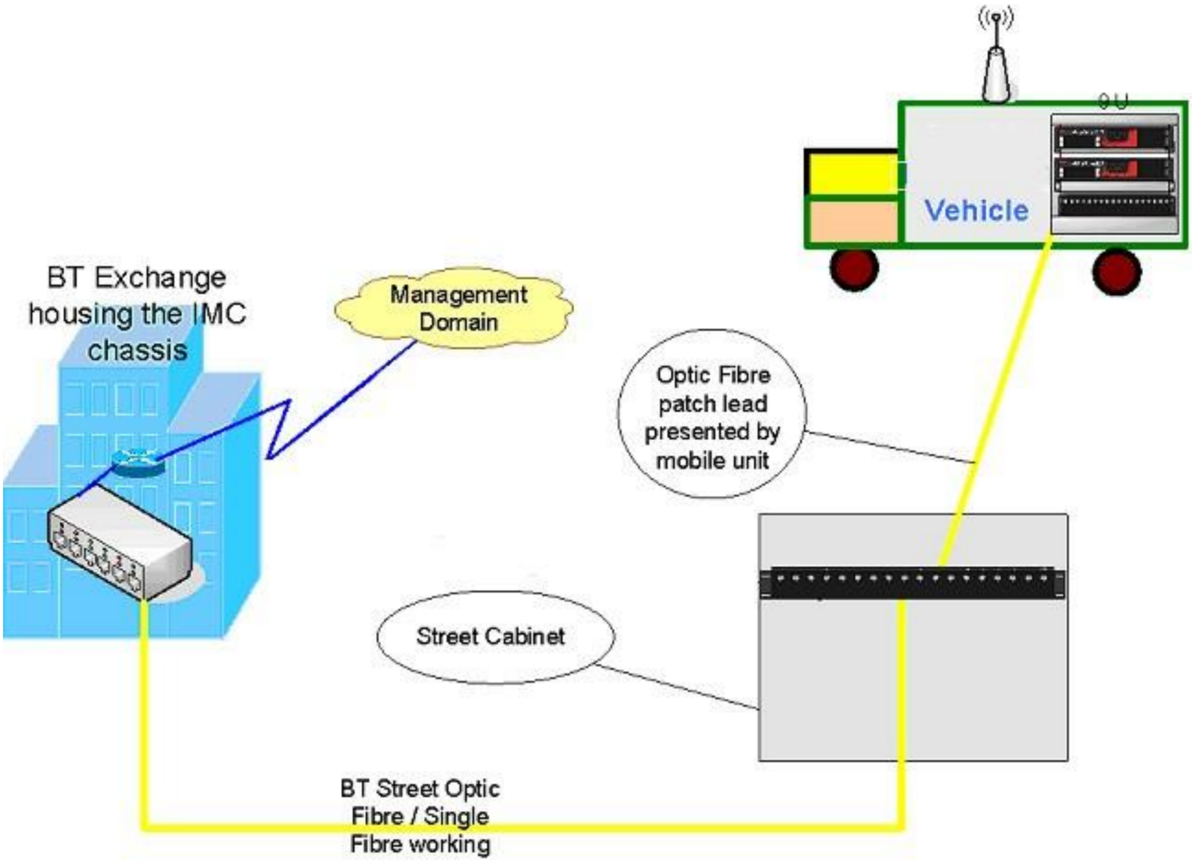

BT Exchange housing the IMC chassis
Management Domain
Vehicle
0U
Optic Fibre patch lead presented by mobile unit
Street Cabinet
BT Street Optic Fibre / Single Fibre working

Figure 2. Service Block Schematic for 1000Mbit/s service

Note: An intermediate exchange may be used between serving exchange street cabinet in a similar fashion to 100Mbit/s service.

3. 100Mbit/s Service Street Access Product features

Key features of the Street Access service are:

100 Mbit/s Fast Ethernet interface 100 Base T (IEEE 802.3[1])
Optical fibre from street furniture to BT local serving exchange
DC Powered NTE in street furniture
Secure connectors at remote NTE for power and data
Compact, rugged NTE design
20 km maximum route fibre distance
10 km maximum main link radial distance

Throughput will be 99% or better depending on the mix of frame sizes
3 Units high, 20 slot ,19 inch chassis used in BT Exchange
Typical installation will be 10 Units to cover fibre management, air flow and label requirements.

3.1 Technical Description

The Full Duplex option is in accordance with IEEE 802.3. The NTE is configured by Openreach to the customer's requirements of Full Duplex at time of installation.

The Street Access NTE is capable of transmitting frame sizes from 64 bytes to a maximum of 1548 bytes. This is to maintain compatibility with a number of frame tagging formats, in particular VLAN tagging as specified in IEEE 802.1[2] with 1522 byte frame size.

Note: The definition of frame lengths includes the 4 byte CRC but does not include any preamble.

The Street Access NTE is offered with a Link Loss Forwarding feature (LLF). BT enables this Link Loss Forwarding feature on installation and it allows a link failure on the BT network to be indicated across the customer interface, so that suitably configured customers' equipment can detect such a network failure.

Autonegotiate is enabled at both ends of the 100Mbit's service.

The overall design of the customer network and the included Street Access circuit will need to be within the normal operating ranges and parameters of Ethernet to operate satisfactorily.

4. 1000Mbit/s Service Street Access Product features

Key features of the Street Access service are:

1000 Mbit/s Fast Ethernet interface 1000 Base SX or LX (IEEE 802.3[1])
Optical fibre from on-site street cabinet to BT local serving exchange AC
Powered NTE in vehicle
Compact NTE design
60 km maximum route fibre distance
30 km maximum radial distance
Throughput will be 99% or better depending on the mix of frame sizes
3 Units high, 10 slot service card (2 slots per card = 20 slot chassis),19 inch chassis used in BT Exchange
Typical installation will be 12 Units to cover fibre management, air flow and label requirements.
The customer must provide an FC/PC patch panel in the vehicle, with an FC/PC tail coming out of the back of the patch panel.
The customer must provide the ruggedised cable to link from the vehicle patch panel to the street cabinet – a single mode, single fibre cable. This must have male FC/PC connections at each end.
The 1000Mbit/s service includes the IEE 802.1d bridging functionality, which allows for the learning and filtering of traffic packets destined for those hosts connected at

the local end. Packets destined for the local end MAC addresses cannot be forwarded across the network fibre to the distant end and vice versa - after these MAC addresses have been learnt and until the system's Cache memory has been refreshed or a host has been disconnected.

4.1 Technical Description

This service is provided in accordance with IEEE 802.3.

The Street Access NTE is capable of transmitting frame sizes from 64 bytes to a maximum of 1536 bytes. This is to maintain compatibility with a number of frame tagging formats, in particular VLAN tagging as specified in IEEE 802.1[2] with 1522 byte frame size.

Note: The definition of frame lengths includes the 4 byte CRC but does not include any preamble.

The 1000M Street Access service DOES NOT offer Link Loss Forwarding feature (LLF). Therefore, the customer interfaces will stay up even when the network fibre is disconnected.

5. Service Availability and Tariffs

For further information on service availability and tariffs please contact:

Your company's Openreach CBM or BT Account manager.

Pricing and Product information can be found at the Openreach web site www.openreach.co.uk

Contacts for further information can be found at http://www.btplc.com/sinet/

6. 100Mbit/s Service Customer Interface Descriptions

6.1 General

Fast Ethernet, or 100BaseT, is conventional Ethernet but faster, operating at 100 Mbit/s instead of 10Mbit/s. Fast Ethernet is based on the proven CSMA/CD Media Access Control (MAC) protocol and can use existing 10BaseT, Category 5 cabling. Data can move from 10 Mbit/s to 100 Mbit/s without protocol translation or changes to application and networking software.

6.2 Exchange End Ethernet presentation

The interface is the Network Termination Point (NTP), i.e. the point of connection on the Openreach Network Terminating Equipment (NTE) for connecting CPE or CP equipment.

The Interface consists of a RJ-45 type socket. The CP / customer provides the category 5 connecting cords between the NTE and their own equipment. The maximum cable length is 100 metres.

The RJ-45 type connector is as specified in the 100BaseT IEEE 802.3 specifications. Attention is drawn to the Intellectual Property Rights (IPRs) set out in the preface of this agreed International standard. It is the responsibility of the supplier of CPE or CP equipment to ensure that they have the necessary rights from the owner of the IPR. The IPR owner has stated that they are willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. The NTE connector socket pin outs are shown for information in Figure 3.

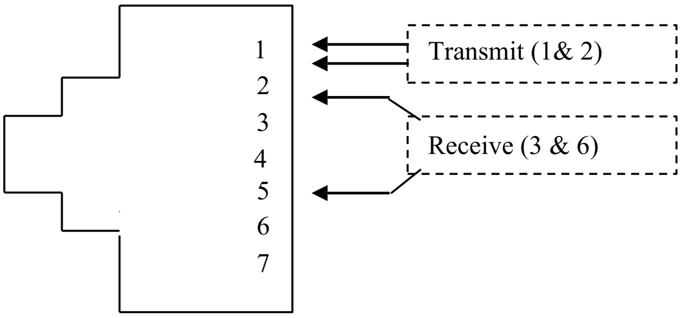


Figure 3. Street Access NTE RJ45 Connector Pin Out Connections

6.3 Remote End Street Furniture Ethernet presentations

The NTE Ethernet cable is terminated on an ITT Mini Sure Seal (MSS) connector. These are available from available from ITT Cannon or from other suppliers:

http://www.ittcannon.com/product.aspx?id=1104

. The table below details the pin outs.

4 way MSS Pin (Female receptacle)	RJ45 Pin	Openreach NTE Output	Customer Signal
Socket 1	1	TX+	RX+
Socket 2	2	TX-	RX-
Pin 3	3	RX+	TX+
Pin 4	6	RX-	TX-

Please note that autonegotiate may reverse the TX and RX signals.
The connector has the pins marked and the specific version is detailed in Figure 4.

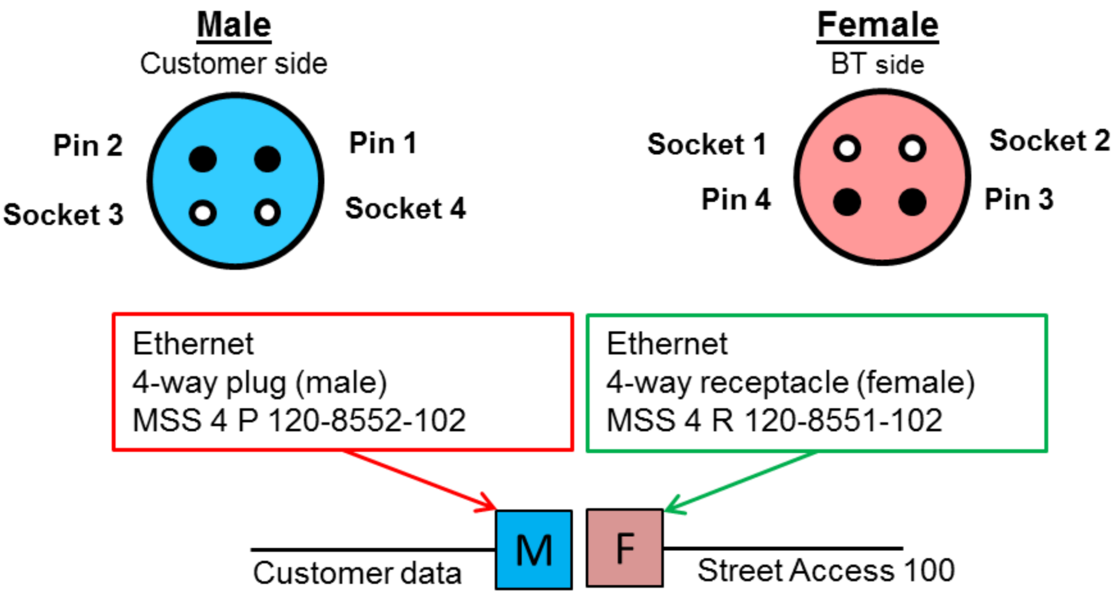

Male
Customer side
Pin 2
Pin 1
Socket 3
Socket 4
Female
BT side
Socket 1
Socket 2
Pin 4
Pin 3
Ethernet
4-way plug (male)
MSS 4 P 120-8552-102
Ethernet
4-way receptacle (female)
MSS 4 R 120-8551-102
Customer data
M
F
Street Access 100

Figure 4. Ethernet Connector details

7. 1000Mbit/s Service Customer Interface Descriptions

7.1 General

The presentation to the customer at the serving exchange and in the vehicle is 1000Base SX (multi-mode) or 10000Base LX (Single mode) dual LC connector type.

8. Transmission

The NTEs are connected to the BT provided uncontended transmission path.

9. Power supply

9.1 Exchange end 20 slot chassis

The 20 slot chassis is locally powered and will require the provision by the CP / customer of local mains 50 Hz AC supply, in the form of two standard 13 Amp power socket(s) for each
20 slot chassis provided. These should be within 2 metres of the NTE installation location. Connection between BT equipment and the power socket will be made using a standard IEC320 power lead fitted with a 13A plug.

The load presented by each power unit is:

AC Input Load: 100 to240V±10% ~ 50/60 Hz, 230 V = 5A

The consumption with a maximum number of 20 service cards provided will be no more than
1150 Watts per chassis.

In addition to the NTE and Chassis powering requirements two 50Hz AC mains supply 13amp sockets should also be provided in the rack , in close proximity to the chassis, One to power Openreach test equipment during both initial commissioning and subsequent maintenance support activities. The second to power the management router associated with the Chassis.

Openreach equipment can be installed on a permanent or a temporary AC power supply provided by the customer, however any subsequent alterations conducted in association with the temporary AC power supply are chargeable.

9.2 100Mbit/s Service Remote End NTE power supply requirements

The remote NTE is DC powered only. The Communications Provider is responsible for the supply and maintenance of this power supply with the following specification:

+24Vdc

Maximum Street Access NTE Load: 40 Watt

(see also 6.3 below for total power supply load)

Maximum Power: 60 Watt

EMI filtering: 47CFR, Part2, Part 15[3] and CISPR PUB, 22 Class A[4]

Protection: Over-voltage, over current and short circuit protection. Auto recovery. UL310, Class 2[5] recognised

Convection cooled, IP 54 certified unit designed for a wet or damp environment.

9.3 100Mbit/s Service Remote NTE Input/Output Power connectors detail

Power cable 24 volt DC Input to NTE: Connects to the Power Supply on an ITT Mini Sure Seal (MSS) connector. These are available from available from ITT Cannon (http://www.ittcannon.com/product.aspx?id=1104

In the Mini-Sure Seal connector

Pin 1 = brown = +ve

Pin 2 = blue = -ve

The pins are identified on the MSS connector body and the part numbers are detailed in the following:

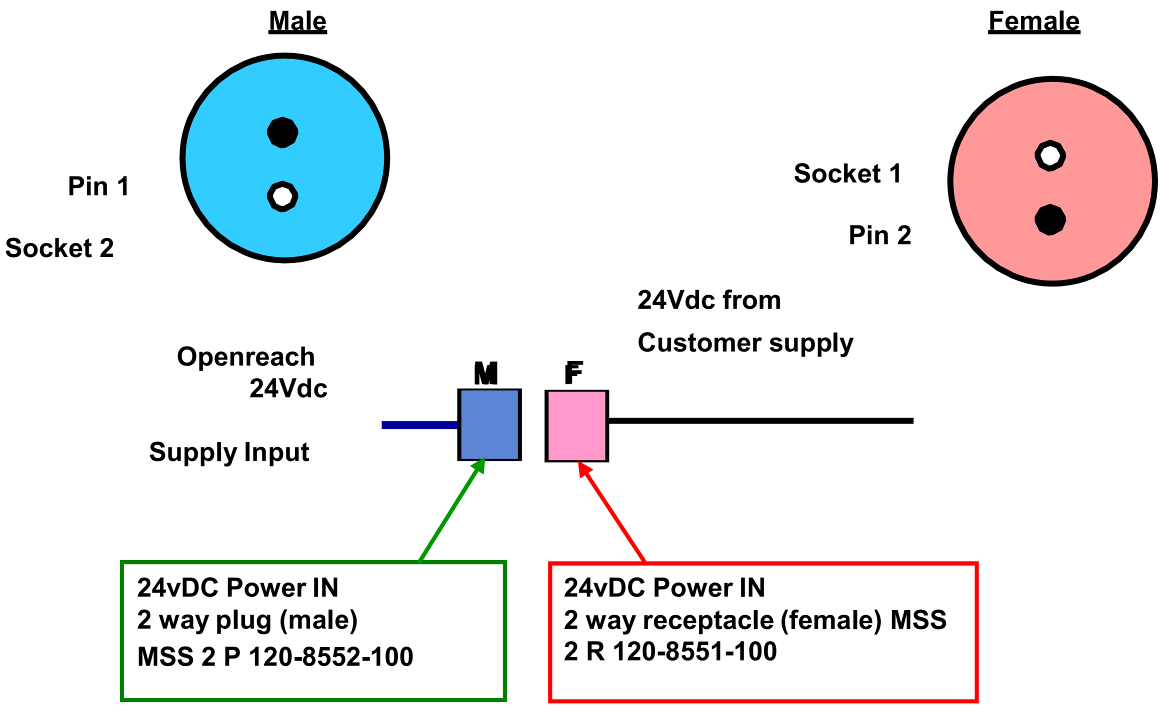

Male
Pin 1
Socket 2
Female
Socket 1
Pin 2
24Vdc from
Customer supply
Openreach
24Vdc
Supply Input
M
F
24vDC Power IN
2 way plug (male)
MSS 2 P 120-8552-100
24vDC Power IN
2 way receptacle (female) MSS
2 R 120-8551-100

Figure 5. Input DC Power Connector detail

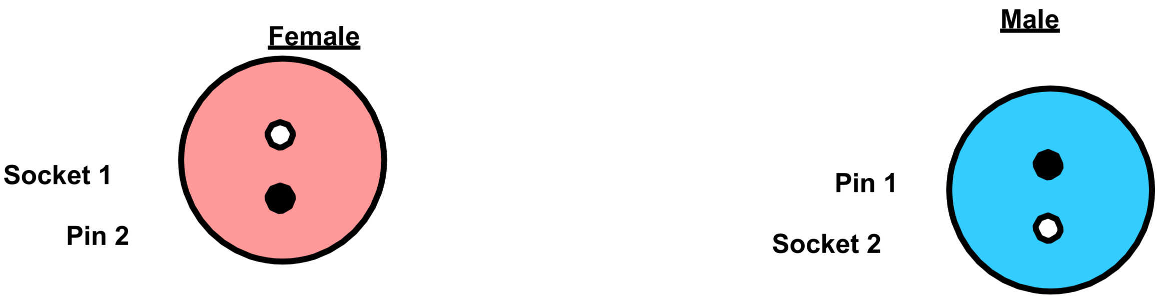
A capability is available for the NTE to also feed +24V DC to other equipment in the external accommodation. This is limited by the overall capability of the power supply used after the 40 Watts for the NTE is deducted. The pin out and connector details are contained below.

Power cable 24 volt DC Output from NTE: Connects to the Power Supply on an ITT Mini Sure Seal (MSS) connector. These are available from available from ITT Cannon (http://www.ittcannon.com/product.aspx?id=1104)

Pin 1 = brown = +ve

Pin 2 = blue = -ve

The pins are identified on the MSS connector body and the part numbers are detailed in Figure 6.


Female
Socket 1
Pin 2
Male
Pin 1
Socket 2

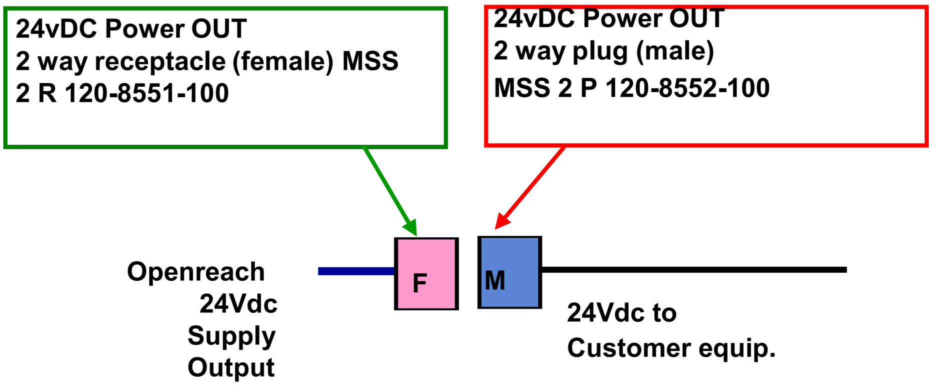

24vDC Power OUT
2 way receptacle (female) MSS
2 R 120-8551-100
24vDC Power OUT
2 way plug (male)
MSS 2 P 120-8552-100
Openreach
24Vdc
Supply
Output
F
M
24Vdc to
Customer equip.

Figure 6. Output DC Power Connector detail

9.4 1000Mbit/s Service broadcast vehicle single card chassis

The single card chassis is locally powered and will require the provision by the CP / customer of local mains 50 Hz AC supply, in the form of a single standard 13 Amp power socket(s) for each service provided. These should be within 2 metres of the NTE installation location. Connection between BT equipment and the power socket will be made using a standard IEC320 power lead.

The load presented by each power unit is:

AC Input Load: 100 to240V±10% ~ 50/60 Hz, 240 V = 1A

The consumption will be no more than 240 Watts per single card chassis.

10. Further Information

For enquiries concerning connection availability between particular sites and for further 'sales and marketing' information on the Street Access service please contact your BT Account Manager or Openreach Sales Relationship manager.

See http://www.openreach.co.uk

11. References

IEEE Standards:

[1]	IEEE 802.3	LAN/MAN CSMA/CD Access Method	2005
[2]	IEEE 802.1	LAN/MAN Bridging & Management	2005
[3]	47CFR	Code of Federal Regulations, Title 47 (47CFR). Part 2 & 15,	1998
[4]	CISPR	Publication 22. "Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment," 1985.	1985
[5]	UL310	Underwriters Laboratories Ltd UL310 Electrical Quick-Connect Terminals	2005

For further information or copies of referenced sources, please see document sources at https://www.openreach.co.uk/orpg/home/helpandsupport/sins/sins.do

12. Abbreviations

CBM	Customer Business Manager
CFR	Code of Federal Regulations
CISPR	International Special Committee on Radio Interference
CP	Communications Provider (Providers of Electronic Communications Services)
CPE	Customer Premises Equipment
CRC	Cyclic Redundancy Check
CSMA/CD	Carrier-Sense Multiple-Access / Collision Detect
EMI	Electromagnetic Interference
IEEE	Institute of Electronic & Electrical Engineers
IPR	Intellectual Property Rights
LAN	Local Area Network
LLF	Link Loss Forwarding
MAC	Medium Access Control
MAN	Metropolitan Area Network
NTE	Network Terminating Equipment
NTP	Network Terminating Point
RJ45	Registered Jack 45

RX	Receive
SIN	Suppliers' Information Note
TX	Transmit
VLAN	Virtual Local Area network
UL	Underwriter's Laboratories

13. History

Issue	Date	Changes
1.0	August 2007	First published.
1.1	August 2008	Clarification of the maximum power loads. Also one minor editorial.
1.2	September 2010	Updated to include detail on 1Gbit/s Street Access product
1.3	1July 2013	Clarification of Auto negotiation settings for 100Mbit/s service
1.4	May 2014	Correction to the table and diagram in section 6.3 showing the Mini Sure Seal (MSS) connector to RJ45 connector pin-out details for Street Access 100. Change SINet site references from http://www.sinet.bt.com to http://www.btplc.com/sinet/
1.5	February 2019	Changes to sections 3 and 4. The following statements o Section 3 (100M): “No bandwidth usage limits” o Section 4 (1000M): “Bandwidth usage up to 99%” Replaced with: “Throughput will be 99% or better depending on the mix of frame sizes”
1.6	September 2020	Changes to branding, from BT to Openreach including changes to reflect new Openreach SIN site and Openreach SIN email address
1.6	September 2021	Annual Review – no changes required – issue remains unchanged.
1.6	September 2022	Annual Review – branding and font changes only – issue remains unchanged.
1.6	October 2022	Annual Review – branding and font changes only – issue remains unchanged.
1.6	October 2023	Annual Review – branding and font changes only – issue remains unchanged.
1.6	October 2025	Annual Review – branding and font changes only – issue remains unchanged.

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